

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

Application No.: 10/723,900

Filing Date: November 25, 2003

Applicant: Charles L. Tazzia

Group Art Unit: 1711

Examiner: Rabon Sergent

Title: A Method for Making an Aqueous Coating With a Solid
Crosslinking Agent

Attorney Docket: IN-5587
HDP Docket No. 0906S-000332

Director of the United States Patent and Trademark Office
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Reply Brief Under 37 C.F.R. § 41.41

Sir:

In response to the Examiner's Answer having a notification date of January 14, 2008, Appellants file this Reply Brief.

Response to the Examiner's Answer regarding the Rejection Under § 103

1. There is no apparent reason to combine Hartung with O'Connor or Gras.

As required by *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007), obviousness includes determining whether there was an apparent reason to combine the known elements in the fashion claimed. And, to facilitate review, this analysis should be made explicit. *Id.*; and see *In re Kahn*, 441 F3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning to support the legal conclusion of obviousness.").

In this case, "[Hartung] fails to disclose an uretdione crosslinking agent that corresponds to appellant's claimed uretdione compound," as noted in the Examiner's Answer on page 3, lines 19-20. Instead, the Hartung reference teaches a great variety of crosslinking agents (paragraphs [0041]-[0069]), including polyisocyanates that may be blocked using any of a plethora of blocking agents (paragraphs [0045]-[0062]). One example of a blocked isocyanate includes a polyisocyanate having a self-blocked uretdione group. Hartung paragraph [0044].

The Examiner's Answer, on page 4, line 21 to page 5, line 3, further notes that Hartung prefers blocked polyisocyanates (Hartung [0070]) and especially:

dimerized and trimerized hexamethylene diisocyanate, isophorone diisocyanate, 2-isocyanatopropylcyclohexyl isocyanate, dicyclohexylmethane 2,4'-diisocyanate, dicyclohexylmethane 4,4'-diisocyanate or 1,3-bis(isocyanatomethyl)cyclohexane (BIC), diisocyanates derived from dimeric fatty acids, as marketed under the commercial designation DDI 1410 by Henkel, 1,8-diisocyanato-4-isocyanatomethyl-ethyloctane, 1,7-diisocyanato-4-isocyanatomethylheptane and/or 1-isocyanato-2-(3-isocyanatopropyl)cyclohexane.
Hartung paragraph [0044].

However, not one of these compounds is an oligomeric uretdione compound, as the presently claimed uretdione compound is formed by the reaction of an uretdione with a diol. Thus, the dimerized or trimerized diisocyanates, even if self-blocked uretdiones,

are not the same as the present oligomer of uretdione residues linked by diol residues. Moreover, the present oligomeric crosslinker is a solid at room temperature (specification page 6, lines 6-7) as compared to many (if not all) of the diisocyanates listed in Hartung being liquids at room temperature.

None of the dimers or trimers listed in Hartung constitutes a structure of uretdiones linked by diols. Nor is there any reason evident in the reference as to why a skilled artisan might modify the Hartung teachings to make such oligomeric crosslinkers from the diisocyanates. Thus, even if "one of ordinary skill upon reading Hartung would be motivated to select from the disclosed list of crosslinking agents dimerized diisocyanates as a preferred group of crosslinking agents," (Examiner's Answer page 5, lines 4-6) such crosslinkers do not include or even suggest the presently claimed oligomeric uretdione compound.

At best the Hartung teachings may serve as a basis for a person of ordinary skill in the art to seek out other blocked isocyanates, such as various derivatives of dimerized and trimerized hexamethylene diisocyanate, isophorone diisocyanate, etc. However, the Examiner has failed to identify any other reason based on Hartung or based on the general knowledge in the art as to why a person of ordinary skill in the art would modify Hartung to include an oligomeric crosslinker of diisocyanates linked by polyols.

2. The disclosed utilities of the O'Connor prepolymer and the Gras polyaddition product are inapplicable to the Hartung aqueous dispersion.

The Examiner's Answer claims that the disclosed utilities for the polyaddition compounds of O'Connor or Gras would have motivated one of ordinary skill to employ an uretdione-containing polyaddition compound as the crosslinking agent of Hartung. Page 4, lines 9-12. However, the contexts in which these compounds are used in the secondary references are unrelated to forming an electrodeposition coating material according to Hartung.

O'Connor forms a pre-polymer by reacting an uretdione with a polyol and further reacts the pre-polymer with an anhydride to form a polyurethane oligomer. Col. 1, lines

47-54; col. 3, lines 48-51. It is then preferable to neutralize substantially all of the carboxylic acid groups in the polyurethane oligomer using a neutralizing agent. Col. 4, lines 42-46. Thus, the pre-polymer is simply an intermediate in a multistep process to form the neutralized polyurethane oligomer. Incorporation of the carboxylic acid groups into the polyurethane structure is an express goal of O'Connor, as it makes it easier to disperse high molecular weight polyurethane in water. Col. 1, lines 19-26. The hydroxyl and carboxylic acid group content makes the resulting polyurethane useful in preparing stable aqueous dispersions. Col. 1, lines 29-40. The polyurethane oligomer is used in an aqueous dispersion to manufacture lignocellulosic composite materials (e.g., particle board). Col. 5, lines 26-53; and see wood moldings in Examples 12-14.

The O'Connor teachings provide no connection to the electrodeposition coating material of Hartung. The polyurethane oligomer is mixed with the lignocellulsoic particles, heated to cure, where the polyurethane oligomer is self-reacting, presumably by reacting the acid groups and self-blocked isocyanates (uretdiones). The polyurethane oligomer is not being used to crosslink a separate active-hydrogen functional resin. In fact, the conversion of the pre-polymer to the polyurethane oligomer by reaction with the anhydride to incorporate acid groups predisposes the product and uses thereof to self-reacting applications. Therefore, if anything, the O'Connor reference teaches away from using the polyurethane oligomer to crosslink a separate resin.

In further distinction, the uretdione compound used in Appellants' claims does not include the residue of an anhydride and subsequently require neutralization of the carboxylic acid groups resulting from reaction with the anhydride, as per O'Connor. There is no reason for a skilled artisan to take the just the prepolymer intermediate of the O'Connor process without completing the additional steps of reacting with the anhydride and neutralization of the resulting acid groups. Hence, there is no apparent reason to combine the O'Connor pre-polymer with the Hartung coating composition.

Gras forms a polyaddition product by reacting polyisocyanate-uretdiones and a diol. Col. 3, lines 46-62. The reaction of the uretdione and diol is carried out continuously in bulk without solvent. Col. 1, line 65 to col. 2, line 2. The polyaddition product is then heated, mixed, and extruded with a hydroxyl group-containing polymer

to form a polyurethane powder coating. Col. 7, lines 28-46; Example C. Or, the polyaddition product is dissolved in organic solvents and homogenized with hydroxyl group-containing polyesters to form one-component polyurethane stoving enamels. Col. 7, lines 47-67; Example D. There is no disclosure regarding aqueous coatings or application via electrodeposition. Thus, the Gras teachings and uses thereof provide no connection to the electrodeposition coating material of Hartung.

In the present case, therefore, no nexus exists between Hartung and either of the secondary references. The option of uretdione group containing diisocyanate crosslinking agents in the production of aqueous, electrodepositable coating compositions, (Examiner's Answer page 5, lines 11-12) as per Hartung, provides no basis for a skilled artisan to make the leap to the polyaddition products of O'Connor or Gras, which contain uretdione groups linked by polyol residues. If the skilled artisan wanted to increase the isocyanate group content, the optional dimers or trimers of diisocyanates according to Hartung would serve that purpose. There is nothing to connect Hartung's crosslinkers with uretdiones linked with polyols.

As no advantage or reason is identified as to why a person of ordinary skill would substitute either the synthesis intermediate prepolymer from O'Connor or the polyaddition product from Gras with an uretdione group containing diisocyanate from Hartung, the present claims are nonobvious.

Finally, selection of the O'Connor prepolymer or the Gras polyaddition product for use in the Hartung aqueous dispersion is based on Appellants' invention. For a finding of obviousness based on a combination of documents, there must be "an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. at 1740-41, 82 USPQ2d at 1396 (emphasis added). Moreover, in seeking to establish obviousness, a combination of references cannot be constructed by using Applicant's disclosure. As stated by the court in *ATD Corporation v. Lydall, Inc.*, 159 F.3d 534, 48 USPQ2d 1321, 1329 (Fed. Cir. 1998):

Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. There must be a teaching or suggestion within the prior art, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular

sources of information, to select particular elements, and to combine them in the way they were combined by the inventor.

Furthermore, the Supreme Court noted in *KSR*, 127 S. Ct. at 1742, 82 USPQ2d at 1397, that:

A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U.S., at 36, 86 S. Ct. 684 (warning against a “temptation to read into the prior art the teachings of the invention in issue” and instructing courts to “‘guard against slipping into the use of hindsight’” (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 412 (C.A.6 1964))).

Only the present claims teach an aqueous, electrodepositable coating composition comprising a dispersion of a cathodically electrodepositable, active hydrogen-functional epoxy resin and the particular uretdione compound.

The Examiner alleges that “the disclosed utilities for the polyaddition compounds within [O’Connor or Gras]” would have motivated the skilled artisan to employ them as the crosslinking agent of Hartung. Examiner’s Answer page 4, lines 8-12. However, the disclosed utility of the pre-polymer of O’Connor is only for building the complete polyurethane oligomer. And the disclosed utility of the polyaddition product of Gras is for use in powder coatings and stoving enamels, not aqueous coating compositions as per Hartung. The test is not whether the individual component might be viewed as providing a benefit – the test is whether the prior art suggests the desirability of the *combination*, not the desirability of each component individually. For this very reason, it is improper to “pick and choose among individual parts of assorted prior art references ‘as a mosaic to recreate a facsimile of the claimed invention.’” *Akzo N.V. v. U.S. Int’l Trade Comm’n*, 808 F.2d 1471, 1481, 1 USPQ2d 1241, 1246 (Fed. Cir. 1986) (quoting *W.L. Gore & Accocs., Inc. v. Garlock*, 721 F.2d 1540, 1552, 220 USPQ 303, 312 (Fed. Cir. 1983)).

Because no apparent reason exists for a skilled artisan to include the missing subject matter, Appellants submit that the rejection should be REVERSED.

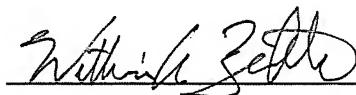
Conclusion

The present claims are patentable over the cited art. Appellants, therefore, respectfully petition this Honorable Board to reverse the final rejection of the claims on each ground and to indicate that all claims are allowable.

Respectfully submitted,

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